

[0013] Embodiments of the invention are described below by referring to the accompanying drawings. Fig. 1 is a diagram of first embodiment of anti-counterfeit paper of the invention. Fig. 1 (A) is a plan view, and Fig. 1 (B) is a sectional view along line A-A in Fig. 1 (A). As shown in Fig. 1, embodiment 1 of anti-counterfeit paper of the invention relates to a configuration in which a plurality of threads 3 are provided in a base paper 2, and the base paper 2 includes a plurality of projections 6 for exposing the threads 3 intermittently, and a covering portion 7 for covering the threads 3 intermittently between the projections. The projections 6 may be same in width as the threads, but are preferably wider, so that the both sides of the threads 3 may be formed as see-through portions 8, and thereby the tolerance (blurring) of threads occurring in the paper making process may be absorbed by the see-through portions.

PATENT ABSTRACTS OF JAPAN

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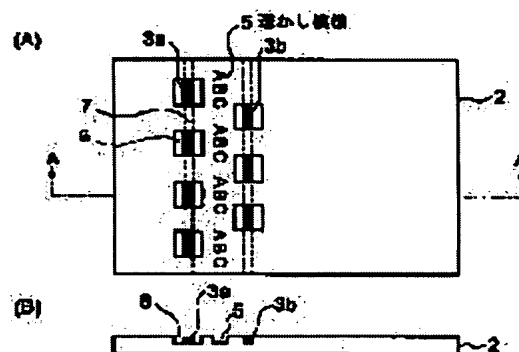
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(54) PAPER FOR PREVENTING FORGERY AND THREAD FOR PAPER FOR PREVENTING FORGERY

(57)Abstract:

PROBLEM TO BE SOLVED: To provide paper whose base paper is patterned with a plurality of threads and which is used for preventing forgery, and to provide the threads for the paper for preventing forgery.

SOLUTION: This paper for preventing forgery is obtained by disposing a plurality of threads 3 in base paper 2 in a parallel pattern. Therein, the base paper 2 has exposure portions 6 intermittently exposing the threads 3 and cover portions 7 intermittently covering the threads 3. The exposure portions and the cover portions of at least two adjacent threads appear in the same state or different state at the same positions from the end of the paper. Two or more threads 3 may be contained in each exposure portion, and the threads may have patterns or letters. Water marks 5 may be disposed between or around the threads. The surfaces of the threads for the forgery-preventing paper are printed to form patterns or letters.



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CLAIMS

[Claim(s)]

[Claim 1] It is the forged prevention form with which it is characterized by to be the forged prevention form which prepared two or more threads in the base paper by ***** in parallel, and for the above-mentioned base paper to be between the expressional section which exposes this thread intermittently, and this expressional section, and for the expressional section and the covering section of two threads which are intermittently equipped with the wrap covering section and adjoin this thread at least concerned to have appeared in status idem in the same location from the edge of a form.

[Claim 2] It is the forged prevention form characterized by to be the forged prevention form which prepared two or more threads in the base paper by ***** in parallel, and to have appeared in the condition that the above-mentioned base paper is between the expressional section which exposes this thread intermittently, and this expressional section, and the expressional section and the covering section of two threads which are intermittently equipped with the wrap covering section and adjoin this thread at least concerned differ from each other in the same location from the edge of a form.

[Claim 3] It is the forged prevention form which is a forged prevention form which prepared two or more threads in the base paper by ***** in parallel, and the above-mentioned base paper is between the expressional section which exposes this thread intermittently, and this expressional section, and is characterized by having the wrap covering section intermittently and containing two or more threads in the expressional section and the covering section concerned in this thread.

[Claim 4] Two threads which are the forged prevention forms which prepared two or more threads in the base paper by ***** in parallel, and adjoin at least are forged prevention forms characterized by being embedded by the pulp of extent to which the pattern or alphabetic character can space and check paper by looking at the base paper.

[Claim 5] One of two threads which are the forged prevention forms which prepared two or more threads by ***** in parallel, and adjoin a base paper at least It is between the expressional section which exposes a base paper intermittently, and this expressional section, and this thread is intermittently appeared in a base paper front face by turns by the wrap covering section. Other one thread The forged prevention form characterized by being embedded by the pulp of extent to which the pattern or alphabetic character can space and check paper by looking at the base paper.

[Claim 6] The forged prevention form which is a forged prevention form which prepared two or more threads in the base paper by ***** in parallel, and is characterized by spacing among two or more threads or on the outskirts of it, and establishing the pattern.

[Claim 7] From claim 1 characterized by the thread of the above-mentioned two or more books consisting of a pattern or a thread containing an alphabetic character to a forged prevention form according to claim 6

[Claim 8] the thread of the above-mentioned two or more books -- a hologram thread, a photoluminescent thread, a printing processing thread, a printing processing hologram thread, a heat-sensitive thread, a fluorescence thread, a magnetic thread, a pattern, or the thread containing an alphabetic character -- since -- the forged prevention form according to claim 6 from claim 1 characterized by consisting of combination of the selected congener or two sorts or more of threads.

[Claim 9] From claim 1 characterized by the above-mentioned thread equipping with a glue line the part which touches pulp to a forged prevention form according to claim 8

[Claim 10] The thread for forged prevention forms which is a thread which consists of a resin film base material for using it for a forged prevention form by *****, and is characterized by the pattern or the alphabetic character being printed by the thread.

[Claim 11] The thread for forged prevention forms according to claim 10 characterized by having a hologram pattern or an optical diffraction grid pattern on the front face of a resin film base material.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to a base paper in detail at the thread for forged prevention forms which uses a photoluminescent thread etc. for the forged prevention form and it which planned advanced forgery and the alteration prevention effectiveness by two or more ***** about the thread for a forged prevention form and forged prevention forms equipped with the thread. Such a forged prevention form can be used for various security media, such as a gift certificate, a gift certificate, a certificate, a ticket, a vote ticket, a ticket, and a label.

[0002]

[Description of the Prior Art] As a forged preventive measure of various security media, the ***** technique is in a form about various threads. Since the forged prevention means by such thread is established in the phase which manufactures a form, forgery by the approach by the color copy, scanner incorporation, platemaking printing, etc. is difficult. However, since sufficient truth judging cannot necessarily be performed in the site where various security media are actually used, together with the forged technique, such as a copy, it may circulate as a genuine article also in the crude counterfeit only by the approach of having stuck simply the forged thread modeled on the thread of Shinsei. Therefore, it is necessary to heighten the forged prevention effectiveness also in the **** lump approach to the security medium of not only the thread itself but a thread.

[0003] About the forged prevention form of entering, such as such a photoluminescent thread, there are JP,6-306799,A, the utility model registration No. (application-for-utility-model-registration Taira No. 1625 [eight to]) 3028886, JP,7-207599,A, etc. however, any advanced technology is ***** about one thread or a photoluminescent split at a base paper -- it is a thing and the technique which aimed at advanced forged prevention by ***** is not seen in two or more threads. Moreover, although the various modes of thread necessity papers, such as a thread form with a window put into JP,10-71759,A by the applicant for this patent from the above viewpoint so that a thread might be expressed from a window part, are proposed, it cannot be said to be what took thoroughgoing measures to the above-mentioned forged technique. Then, this invention attained much more difficult-ization of forgery and alteration prevention by preparing two or more [of various the **** lump gestalten] using a thread. Furthermore, it is going to plan much more forged prevention effectiveness by proposing what performed printing of a pattern or an alphabetic character to the thread itself, and heightened the forged prevention effectiveness, and using it combining the congener of the thread of these various kinds, or different species.

[0004]

[Means for Solving the Problem] The 1st of the summary of this invention for solving the above-mentioned technical problem It is the forged prevention form which prepared two or more threads in the base paper by ***** in parallel. The above-mentioned base paper It is between the expressional section which exposes this thread intermittently, and this expressional section, and is in the forged prevention form characterized by the expressional section and the covering section of two threads which are intermittently equipped with the wrap covering section and adjoin at least concerned having appeared this thread in status idem in the same location from the edge of a form. Since it is this forged prevention form, forgery and an alteration are difficult.

[0005] The 2nd of the summary of this invention for solving the above-mentioned technical problem

It is the forged prevention form which prepared two or more threads in the base paper by ***** in parallel. The above-mentioned base paper Are between the expressional section which exposes this thread intermittently, and this expressional section, and it has the wrap covering section for this thread intermittently. The expressional section and the covering section of two threads which adjoin at least concerned are in the forged prevention form characterized by having appeared in the condition of differing in the same location from the edge of a form. Since it is this forged prevention form, forgery and an alteration are difficult.

[0006] The 3rd is the forged prevention form which prepared two or more threads in the base paper of the summary of this invention for solving the above-mentioned technical problem by ***** in parallel, and the above-mentioned base paper is to the forged prevention form which is between the expressional section which exposes this thread intermittently, and this expressional section, and is characterized by having the wrap covering section intermittently and containing two or more threads in the expressional section and the covering section concerned in this thread. Since it is this forged prevention form, forgery and an alteration are difficult.

[0007] The 4th is the forged prevention form which prepared two or more threads in the base paper of the summary of this invention for solving the above-mentioned technical problem by ***** in parallel, and two threads which adjoin at least are in the forged prevention form characterized by being embedded by the pulp of extent to which the pattern or alphabetic character can space and check paper by looking at the base paper. Since it is this forged prevention form, forgery and an alteration are difficult.

[0008] The 5th of the summary of this invention for solving the above-mentioned technical problem One of two threads which are the forged prevention forms which prepared two or more threads by ***** in parallel, and adjoin a base paper at least It is between the expressional section which exposes a base paper intermittently, and this expressional section, and this thread is intermittently appeared in a base paper front face by turns by the wrap covering section. Other one thread It is in the forged prevention form characterized by being embedded by the pulp of extent to which the pattern or alphabetic character can space and check paper by looking at the base paper. Since it is this forged prevention form, forgery and an alteration are difficult.

[0009] The 6th is the forged prevention form which prepared two or more threads in the base paper of the summary of this invention for solving the above-mentioned technical problem by ***** in parallel, and is in the forged prevention form characterized by spacing among two or more threads or on the outskirts of it, and establishing the pattern. Since it is this forged prevention form, forgery and an alteration are difficult.

[0010] The 7th of the summary of this invention for solving the above-mentioned technical problem is a thread which consists of a resin film base material for using it for a forged prevention form by ***** , and is in the thread for forged prevention forms characterized by the pattern or the alphabetic character being printed by the thread. Since it is this thread for forged prevention forms, forgery and an alteration can use it suitable for a difficult forged prevention form.

[0011]

[Embodiment of the Invention] the forged prevention form put in so that a thread might be expressed to a window part is ***** about a photoluminescent thread etc. at a base paper -- it is the form of a type and what was intermittently equipped with the wrap covering section is known in the photoluminescent thread between the expressional section (window) to which a base paper exposes a photoluminescent thread intermittently, and this expressional section. On one **** mesh part of a multiple cylinder system paper machine, the forged prevention form of this configuration prepares double-width small heights from the same width of face as a thread, or it, and can manufacture them by supplying paper stock liquid, where a thread is carried on these heights. That is, if it does in this way, in a location without heights, since a thread is inserted by paper stock liquid, the covering section is formed, and since a thread is exposed from the inferior-surface-of-tongue side of paper stock liquid, the expressional section will be formed in the location of heights.

[0012] In a thread form with a window like the above-mentioned configuration, since the photoluminescent thread etc. is intermittently exposed in the expressional section, even when it copies, forged prevention can be carried out from a metal color not being reproduced. Moreover, in order to see whether it is a counterfeit, it is not necessary to check the end face of a form, and it can

prevent that a photoluminescent thread etc. peels from a base paper.

[0013] Hereafter, the operation gestalt of this invention will be explained with reference to a drawing. Drawing 1 is drawing showing the 1st operation gestalt of the forged prevention form of this invention. The cross section [in / drawing 1 (A), and / in drawing 1 (B) / the A-A line of drawing 1 (A)] is shown. [the top view] like drawing 1 , it is two or more ***** about a thread 3 with the 1st operation gestalt of the forged prevention form of this invention at a base paper 2 -- it is a configuration and the base paper 2 is intermittently equipped with the wrap covering section 7 for the thread 3 between two or more expressional sections 6 which expose a thread 3 intermittently, and each expressional section. Although a thread and this width of face are sufficient as the expressional section 6, by spacing both the sides of a thread 3 as double width, and making it become the section 8 from it, it can space the tolerance (Bure) of the thread generated at the time of paper milling, and can absorb it by the section.

[0014] With this 1st operation gestalt, there is the description to which the expressional section 6 and the covering section 7 have appeared in status idem in the same location from the edge of the form in a thread edge to two or more threads. That is, in the location of a paper end to x, also to thread 3a, it is the expressional section and has become [as opposed to / both / thread 3b / as opposed to / both / thread 3b] the covering section from the paper end also to thread 3a in the location of y. However, as for a base paper 2, it is desirable that a part for the both ends of a thread 3 is constituted as the covering section 7 also to which thread. It is because exfoliation of a thread will arise if the edge of a thread is exposed. Although more nearly especially the width of face of the thread to be used is not restricted to the purpose of using a form, either, a 0.2mm - about 5mm thing is usually used. The width of face of two or more threads does not need to be this width of face, and it is also arbitrary to change a color tone, an optical property, a coloring property, magnetic properties, etc., respectively. Thus, since, as for the approach that a forged thread is simply stuck by introducing two or more two or more threads into a security medium, forged cost increases and a process becomes complicated, forged depressor effect increases.

[0015] Drawing 2 is drawing showing the 2nd operation gestalt of the forged prevention form of this invention. The cross section [in / drawing 2 (A), and / in drawing 2 (B) / the A-A line of drawing 2 (A)] is shown. [the top view] like drawing 2 , it is two or more ***** about a thread 3 with the 2nd operation gestalt of the forged prevention form of this invention at a base paper 2 -- it is a configuration and having the wrap covering section 7 intermittently has a base paper 2 said 1 with the 1st operation gestalt in a thread 3 between two or more expressional sections 6 which expose a thread 3 intermittently, and each expressional section. With this 2nd operation gestalt, there is the description which has appeared in the condition that the expressional section 6 differs from the covering section 7 in the same location from the edge of the form in a thread edge in between two threads adjoined of two or more threads at least. That is, in the location of x, it is the covering section from the paper end to expressional section and thread 3b to thread 3a. However, the base paper 2 is the same as that of the 1st operation gestalt, and that of the thing with desirable a part for the both ends of a thread 3 being constituted as the covering section 7 is the same also in the following operation gestalten. Thus, climax of the thread section at the time of accumulating a form for the expressional section, when [so-called] preparing alternately can be reduced, printing processing can be made easy, and the volume collapse at the time of the handling of a rolling-up form can be prevented.

[0016] Drawing 3 is drawing showing the 3rd operation gestalt of the forged prevention form of this invention. The cross section [in / drawing 3 (A), and / in drawing 3 (B) / the A-A line of drawing 3 (A)] is shown. [the top view] Like drawing 3 , with the 3rd operation gestalt of the forged prevention form of this invention it is two or more ***** about a thread 3 at a base paper 2, although it is a configuration and the base paper 2 has had the wrap covering section 7 said 1 with the 1st operation gestalt intermittently in the thread 3 between two or more expressional sections 6 which expose a thread 3 intermittently, and each expressional section With this 3rd operation gestalt, there is the description in which two or more threads 3a and 3b are contained in the one expressional section 6 and covering section 7. Thus, when preparing two or more threads in the one expressional section, the bending fall of the expressional section on the strength can be compensated.

[0017] Drawing 4 is drawing showing the 4th operation gestalt of the forged prevention form of this

invention. The cross section [in / drawing 4 (A), and / in drawing 4 (B) / the A-A line of drawing 4 (A)] is shown. [the top view] like drawing 4 , it is two or more ***** about a thread 3 with the 4th operation gestalt of the forged prevention form of this invention at a base paper 2 -- although it is a configuration, a base paper 2 does not have the expressional section which exposes a thread 3 intermittently, but a thread has the description currently embedded by the pulp 21 of extent to which the pattern or alphabetic character can space and check paper by looking at the base paper. If the printing pattern or the alphabetic character is formed in such an embedding thread, the pattern of a thread etc. can be checked by looking by adjustment of the pulp on a thread. What is necessary is just to choose the printing side of the printing pattern over a thread even from the front face of forged prevention form denomination suitably so that it can check by looking from a rear face or both sides further. Thus, since it will become difficult to discriminate the ingredient which constitutes a thread from an appearance if two or more threads of all are embedded in a form, when one thread is used as a machine-recognition mold, or when the machine-recognition mold thread from which a class differs is used together, it is effective in it becoming difficult what kind of for which thread to analyze whether machine recognition is carried out.

[0018] Since a base paper with usually bright white etc. is used, originally a forged prevention form has the permeability of light. Therefore, if there is a pattern that the reflected light from a thread will arise and it will be based on a coloring agent on the surface of a thread if the light which carried out incidence from the front face of paper reaches to a thread, or an alphabetic character, absorption by the coloring agent will arise, and since other parts and spectral characteristics differ from each other, the reflected light with absorption can be distinguished also by people's eyes. Usually, in a forged prevention form, it is 104 g/m². The paper of extent is used and the thin pulp 21 sides are 35 g/m². If it is extent, the pattern on a thread can fully be observed or it can distinguish. Moreover, thick pulp sides are 70 g/m². Even if it is extent, although the pattern or alphabetic character on a thread is inferior, it can be observed, or can distinguish plainness.

[0019] Drawing 5 is drawing showing the 5th operation gestalt of the forged prevention form of this invention. The cross section [in / drawing 5 (A), and / in drawing 5 (B) / the A-A line of drawing 5 (A)] is shown. [the top view] like drawing 5 , it is two or more ***** about a thread 3 with the 5th operation gestalt of the forged prevention form of this invention at a base paper 2, although it is a configuration One of two threads 3a and 3b which adjoin at least Are between the expressional section 6 which exposes a base paper intermittently, and this expressional section, and this thread is intermittently appeared in a base paper front face by turns by the wrap covering section 7. Other one thread has the description in which the whole is embedded by pulp 21 with thin extent which the surface pattern spaces paper and can check by looking from a front face or a rear face at the base paper. In this case, when forging by the technique of sticking a forged thread simply, it is necessary to reproduce the thread in the condition of differing on an appearance, respectively, and the forged prevention effectiveness increases by increase of forged cost, and process complication.

[0020] Drawing 6 is drawing showing the 6th operation gestalt of the forged prevention form of this invention. The cross section [in / drawing 6 (A), and / in drawing 6 (B) / the A-A line of drawing 6 (A)] is shown. [the top view] like drawing 6 , it is two or more ***** about a thread 3 with the 6th operation gestalt of the forged prevention form of this invention at a base paper 2 -- although it is a configuration, it is characterized by spacing among two or more threads or on the outskirts of it, and establishing the pattern 5. In this case, one of two threads 3a and 3b which adjoin at least is desirable at the point that are between the expressional section 6 which exposes a base paper intermittently, and this expressional section, and it makes forgery and an alteration difficult that it is in the condition of appearing this thread in a base paper front face by turns by the wrap covering section 7 intermittently. By forming the watermark pattern 5 in a forged prevention form in this way, by the approach of having stuck simply the forged thread modeled on the thread, it cannot forge but is effective in making the forgery which a hand which forms a watermark pattern requires, and the volition which performs an alteration decline.

[0021] Next, the manufacture condition of the forged prevention form of this invention is explained. Drawing 7 is drawing showing a ***** condition for the forged prevention form containing a thread. Drawing 7 (A) is set in a cross section parallel to a thread, drawing 7 (B) is set to drawing 7 (A), and the cross section in a C-C line right-angled to a thread and drawing 7 (C) show the cross

section in D-D line similarly. Like illustration, rather than a thread 3, this width of face, or it, this thread necessity paper prepares heights 9a of a double-width plow mesh part in the plow mesh part 9 of a paper machine at proper spacing, and can manufacture it by supplying paper-stock-liquid 2a, where a thread 3 is carried on this heights 9a. That is, if it does in this way, since the covering section 7 will be formed since a thread 3 is inserted by paper-stock-liquid 2a in the location between heights 9a and heights 9a and a thread 3 will serve as the lowest side in the location of heights 9a, when a form is exfoliated from the wire cloth of a paper machine, a thread 3 appears in a front face and the expressional section 6 is formed. When making heights 9a of a plow mesh part into a thread 3 and this width of face like drawing 7 (D), it will space through the both sides of a thread 3, and the section 8 will not enter. Moreover, when considering as double width which straddles a thread, the watermark section can enter, decorative effectiveness can be heightened and Bure of a thread can be absorbed as mentioned above. Moreover, what is necessary is just to form pattern-like heights in a plow mesh part like heights 9a, when spacing among two or more threads or on the outskirts of it and establishing a pattern 5.

[0022] Next, the various kinds of the thread for forged prevention forms used for this invention are explained.

In the <hologram thread> hologram thread 3, the thread which has a hologram (or optical diffraction grid) pattern at the front face or rear face of a thread is said. After the hologram layer (or you may be the optical diffraction latticed layer) prepared on a base material film applies the hologram formative layers, such as an ultraviolet curing mold resin constituent, on a base material film, carrying out nickel plating of the hologram mold version which performed hologram exposure to resist resin at another process, and carried out pattern formation by etching, pushing the hologram mold version which moved hologram micro embossing and produced it to the plating side, and reproducing a hologram is performed. To the coating resin which carried out hologram templating, ultraviolet rays are irradiated and are stiffened. At the continuous process, the hologram mold version is formed in the shape of a roll.

[0023] In addition, as an ultraviolet curing mold resin constituent, the constituent which added the sensitizer is used for what mixed suitably a partial saturation ethylene system monomer and partial saturation ethylene system oligomer. The hologram stratification is possible also at processes other than photo-curing, and thermosetting resin, such as thermoplastics, such as acrylic resin, polystyrene resin, and a polycarbonate, melamine resin, an epoxy resin, and urethane resin, is also used in this case. Usually the hologram layer itself is formed in the thickness of 5 micrometers or less. Since the thread which has such a hologram pattern is difficult to reproduce, it can be said that the forged prevention effectiveness is higher.

[0024] As a <photoluminescent thread> photoluminescent thread 3, metallic foils, such as aluminum foil, can be used, photoluminescent metal vacuum evaporation of aluminum, nickel, chromium, silver, etc. can be carried out to a base material film, or the thread which has a hologram (or optical diffraction grid) pattern can be used. Since the part of the photoluminescent thread 3 will be reflected to rainbow color when the part of the photoluminescent thread 3 is copied black and a hologram pattern is used if a color copy is carried out when aluminum foil is used, forged prevention can be aimed at, respectively. Furthermore, the photoluminescent thread 3 which has a hologram pattern can carry out the slit of what formed the hologram pattern which consists of resin which has the transparency of polypropylene resin, polyester resin, polyamide resin, polycarbonate resin, polyvinyl chloride resin, acrylic resin, polystyrene resin, melamine resin, an epoxy resin, urethane resin, or an ethylene-vinylalcohol copolymer on the film base material, and formed metal vacuum evaporation layers, such as aluminum, on it to a narrow width, and can use it for it.

[0025] After the <printing processing thread> printing processing thread 3 performs printing of a pattern or an alphabetic character to the front face of plastic film, a metallic foil film, or a photoluminescent film, or the rear face of a transparent base material, it is judged to a narrow width and made into a thread. Thus, since a direct pattern and an alphabetic character can be vividly observed in the expressional section and a pattern that spaced the pulp covered with the covering section and it was printed by the thread, and an alphabetic character can be observed by a different color tone and concentration by performing printing processing to the thread beforehand, truth can be more certainly judged by the difference between the color tone and concentration. Thus, since a

pattern or the thread containing an alphabetic character has a printing pattern unlike the usual thread, it has the effectiveness which makes forgery and an alteration much more difficult.

[0026] Drawing 8 is drawing showing the operation gestalt of a printing processing thread. Since a printing processing thread can choose suitably the order of a laminating of a base material film, coloring printing, and overprint, it has various kinds of operation gestalten, but if the main operation gestalten are mentioned, it will become like drawing 8. The operation gestalt and drawing 8 (B) which drawing 8 (A) carried out flesh-side printing of the coloring printing 32 to one transparence base material film 31t field through primer layer 31p, and gave coloring overprint 32p further The operation gestalt and drawing 8 (C) which carried out direct flesh-side printing of the coloring printing 32 to one transparence base material film 31t field, and gave transparence overprint 32p further The coloring printing 32 is direct-table-printed to one field of coloring base material film 31c, and is carried out to it, it is the operation gestalt which gave transparence overprint 32p further, and the sectional view is shown, respectively. When an arrow-head side becomes the front-face side of a forged prevention form, for example, all are printed with "ABC" in a small letter, and it observes from a front face, in any case, it will be visible like drawing 8 (D). In addition, although overprint 32p does not need to prepare, when a coloring printing layer turns into the outermost layer, endurance will become a little weak. The original color effectiveness can be demonstrated with the combination of the color of the coloring printing 32, overprint 32p, or the base material film 31. The thread in which the printing pattern of such a fine pattern or an alphabetic character was formed will be called "a pattern or the thread containing an alphabetic character."

[0027] As a base material film, the others and capacitor form which is the film which gave metal vacuum evaporatio, an aluminum foil film, or a laminated film with aluminum foil can be used for polyester film including a polyethylene terephthalate film, a polystyrene film, a polypropylene film, the poly ape phone film, a polyphenylene sulfide film, a polycarbonate film, a cellulose system resin film, and the resin film of these various kinds, for example. As thickness of a base material film, in order not to produce irregularity in 1-200 micrometers and the **** lump section, a thin base material is good and the thickness of 10-50 micrometers can be recommended preferably.

[0028] In order to print to these base materials, gravure, offset, silk screen printing, etc. are performed. When printing at a continuous process on the film of the continuous letter of rolling up, rotogravure, offset rotation, and rotary silk screen printing are performed preferably. As long as it satisfies requirements, such as a water resisting property, also as a coloring agent as printing ink to be used that what is necessary is just a thing equipped with a certain amount of thermal resistance at the time of using the water resisting property and forged prevention form in a paper-making process for various kinds of purposes etc., you may be any of a pigment system and a color system. When adhesive strength sufficient in direct printing to a base material film is not obtained, printing through a primer layer as mentioned above is performed. Preparing overprint on a printing pattern furthermore for protection of a printing layer is also usually performed. In addition, a pattern or an alphabetic character can also be given with similar means other than direct printing, for example, has the decalcomania approach, thermal-ink-transfer-printing printing, the embossing approach, etc., and these are not excepted from the operation gestalt of this invention.

[0029] By the thread which printed on the film which has a <printing processing HOROSU red> hologram, there are compounded forgery by the hologram and printing and the description which the alteration prevention effectiveness produces. Drawing 9 is drawing showing the operation gestalt of printing processing HOROSU red. It is the gestalt which there were various kinds of operation gestalten also in printing processing HOROSU red, drawing 9 (A) processed the hologram layer 33 on the field of another side after carrying out front printing of the coloring printing 32 to one field of the base material film 31, and formed the vacuum evaporatio layers 34, such as aluminum, on the hologram layer further. A hologram layer may be prepared before printing processing. Although photoluminescent [of a thread] becomes high since the whole surface aluminum vacuum evaporatio layer 34 is formed in the case of this operation gestalt, the inferior surface of tongue of a thread will be concealed.

[0030] Drawing 9 (B) is the gestalt which formed the transparence vacuum evaporatio layer 35 on the hologram layer concerned, and formed the coloring printing 32 by flesh-side printing on the transparence vacuum evaporatio layer 35 concerned further, after processing the hologram layer

33 into the base material film 31. Since the transparency vacuum evaporation layer 35 is formed, the diffracted light of light arises by the hologram layer, and also in the case of this operation gestalt, a transparency vacuum evaporation layer is spaced, and it is effective in the printing layer and paper base of that bottom being observable. Drawing 9 (C) is the gestalt which processed the hologram layer 33 on the printing side concerned, and formed the aluminum vacuum evaporation layer 34 on the hologram layer further, after performing coloring printing 32 to the base material film 31 by flesh-side printing through primer layer 31p. Since the whole surface aluminum vacuum evaporation layer 34 is formed also in this operation gestalt, although photoluminescent [of a thread] becomes high, a thread inferior surface of tongue will be concealed. Moreover, since a printing side has a thread in the inferior surface of tongue of a base material film by ***** rare ***** , the effectiveness of protection of the printing section becomes high. In all, an arrow-head side becomes the front-face side of a forged prevention form. Transparent ink is desirable, in order not to check brightness of a hologram except that the aforementioned conditions are fulfilled as printing ink to be used.

[0031] The vacuum evaporation layer 34 forms a case to carry out total reflection of the light from a front face as an opaque reflecting layer, and alloys, such as a metal of photoluminescent single components, such as aluminum, chromium, nickel or silver, and gold, and bronze, brass, cupronickel, etc. are used for the metal vacuum evaporation in that case. In aluminum vacuum evaporation etc., it forms in the thickness of 100A - about 2000A, but it is 200A - about 1000A in thickness preferably. An alloy is used when adjusting the reflection factor of coloring or a thin film, but when using metallic compounds, there is effectiveness made by the selection in transparency or a translucent vacuum evaporation layer. Metallic compounds, such as a metal or oxide of an alloy, and a sulfide, can be used for this, and zinc sulfide (ZnS), titanium oxide (TiO₂), magnesium fluoride (MgF₂), barium titanate (BaTiO₂), etc. are used preferably.

[0032] It is the thread which applied or printed and formed the charge of a heat-sensitive material reversibly discolored by the temperature change on the <heat-sensitive thread> base material film, and since it will return to the original color again if it discolored by the temperature at the time of having in heating, change of atmospheric temperature, or a hand and temperature falls, the Shinsei article or a counterfeit is easily discriminable. The ingredient in which such heat-sensitive nature is shown can use as an indispensable component three components of ***** of the non-volatile which desensitizes the color reaction of an electron-donative organic compound, the compound which has a phenolic hydroxyl group, and these two compounds, and what distributed in the vehicle what dissolved or distributed such a compound soon in the vehicle, or was connoted to the minute capsule can be used for it as printing ink. Since such a charge of a heat-sensitive material is transparent unlike the thermochromism material conventional by a remarkable color change being shown from colorlessness to colored or from colored to colorlessness, it has the description which can check a substrate by looking. Moreover, such a coloring agent can also be changed from colored to colored by adding a general color, a pigment, etc.

[0033] for example, as an electron-donative coloration nature organic compound As a compound which has 3-diethylamino, 6-methyl, 7-KURORU fluoran, and a phenolic hydroxyl group Suitably a micro crystallin wax as stearyl alcohol and a vehicle as bisphenol A and a desensitization compound ***** , The printed matter by the ingredient which carried out heating fusion and which was homogenized to 100-degreeC presents red by 20-degreeC, and when it changes to colorlessness and returns to 20-degreeC by heating to 50-degreeC, it shows the reversibility which becomes red again. Moreover, as a compound which has crystal violet lactone and a phenolic hydroxyl group as an electron-donative coloration nature organic compound, the printed matter by the ingredient which carried out as gallic-acid lauryl ester and a desensitization compound at myristyl alcohol, carried out heating fusion of the micro crystallin wax suitably as a vehicle at ***** and 100-degreeC, and was homogenized presents colorlessness by 20-degreeC, and when it changes to blue and returns to 20-degreeC by heating to 50-degreeC, the reversibility which becomes colorlessness again is shown. In addition, the selection range and combination of an ingredient are able to control various ***** , a color tone, and a temperature requirement.

[0034] It is the thread which applied or printed and formed the ingredient which emits light in fluorescence in response to a stimulus of light on the <fluorescence thread> base material film, and

there is phosphorescence which stores the fluorescence in a narrow sense and the light which emit light at the time of light-receiving, and emits light after a stimulus halt. As for an organic fluorescence ingredient, fluorescence in a narrow sense and an inorganic fluorescence ingredient have many things belonging to ****. RUMOGEN L yellow, the RUMOGEN brilliant yellow, and the RUMOGEN brilliant green are known in response to the ultraviolet rays of the black light as an organic fluorescence ingredient which emits light in yellow thru/or green fluorescence. Moreover, as an inorganic fluorescence ingredient, ZnS:Cu (green), S:Cu (Zn, Cd) (yellow), CaS:Bi (blue), S:Cu (Zn, Cd) (sour orange), S:Cu (Zn, Cd) (red), etc. can be used.

[0035] It is the thread which made the coating material the ingredient in which magnetism is shown, applied or printed it, and formed it on the <magnetic thread> base material film, and since it reacts to a magnet, iron powder, etc., the Shinsei article or a counterfeit is easily discriminable. as the high holding power ingredient of a magnetic material -- BaFe₁₂O₁₃, gamma-Fe₂O₃, Co-gamma-Fe₂O₃, and Fe₃O₄ etc. -- it is and there are the Sendust alloy, a nickel-Zn ferrite, a Mn-Zn ferrite, Mo-permalloy powder, etc. as a low coercive force ingredient. The particle size of these magnetic substance can use a dozens of nm - several micrometers thing into giant-molecule resin binders, such as polyester resin and an epoxy resin, carrying out dissolution distribution.

[0036] In addition, what equipped the rear face with the glue line which it becomes from a water-soluble binder with a heat melting temperature [C] of 60-80 degrees etc. about each above-mentioned thread in the ***** case can be used. Thus, since a thread 3 will paste a base paper 2 where a forged prevention form is completed if constituted, the adhesion of a base paper 2 and the photoluminescent thread 3 improves.

[0037]

[Example] (Example) The example of this invention is hereafter explained with reference to a drawing.

As a base material film 31 of the thread for <production of printing processing thread> forged prevention forms, printing by the specification of the following [gravure] was performed to the transparent polyethylene terephthalate film (the "lumiler S-28" by Toray Industries, Inc.) with a thickness of 16 micrometers.

- The coat of the priming-coat primer agent (the "THF primer" (polyester, vinyl-chloride-acetate resin mixed stock) by THE ink tech incorporated company) was carried out to 0.6g/m² using the shallow gravure version of version **.

- The pattern which consists of combination of the small letter of coloring pattern printing "ABC" was printed by flesh-side printing using red ink (the "coloring OP varnish red" (vinyl-chloride-acetate resin system) by THE ink tech incorporated company). The gravure direct version was used for the printing version.

- Overprint coat 32p was performed after coloring pattern printing using the varnish for coloring overprint of a light blue color (the "coloring OP varnish blue" (vinyl-chloride-acetate resin system) by THE ink tech incorporated company) (drawing 8 (A)).

The slitting machine machine was used, and beating of the thread printed as mentioned above was carried out to 2mm width of face, and it was made into the thread for forged prevention forms.

[0038] As a base material film 31 of the thread for <production of printing processing HOROSU red> forged prevention forms, the thing in which the hologram layer 33 was formed was used for the polyethylene terephthalate film (the "lumiler S-28" by Toray Industries, Inc.) with a transparent thickness of 16 micrometers. Ultraviolet-rays hardenability acrylic resin ("YUPIMA LZ065S" by Mitsubishi Chemical, Inc.) is used for hologram pattern formation, and it is 1.5 g/m² with the gravure reverse coat method on a base material film. After carrying out coating, heat embossing of the hologram pattern mold version is carried out, a pattern is copied, carries out UV irradiation, and it enabled it to hold the concavo-convex pattern of a hologram completely. Then, titanium oxide (TiO₂) was used, on the hologram layer 33, the transparence vacuum evaporatio layer 35 was formed in the thickness of 450A, and the pattern of the small letter of "ABC" was further printed by flesh-side printing on it using red ink (the "coloring OP varnish red" (vinyl-chloride-acetate resin system) by THE ink tech incorporated company) (drawing 9 (B)). Then, like the printing processing thread, the slitting machine machine was used, beating was carried out to 2mm width of face, and it considered as the thread for forged prevention forms.

[0039] As appeared in a forged prevention form like drawing 3 in every one two, the printing processing thread manufactured by the <paper milling of forged prevention form> above, and printing processing HOROSU red, the expressional section 6 milled paper to 90kg / duodecimo paper of fine quality with the paper machine of the ***** pattern with which pitch 10mmx width of face of 30mm and the covering section 7 are repeated by pitch 10mm. In addition, for the pulp of the upper part of the covering section 7, the pulp of the lower part of 35 g/m2 and the covering section is 69 g/m2. The height of the heights of a ***** mesh part was adjusted so that it might become. The completed forged prevention form is also set in the covering section. Thus, a printing processing thread, In any [of printing processing HOROSU red] case, a small letter is discriminable, and brightness of printing processing HOROSU red is seen in the expressional section. In the expressional section of a hologram thread Since small letter printing was in sight through a hologram pattern, by back printing, it could distinguish from what added printing certainly, and was able to be used useful as a forged prevention form.

[0040]

[Effect of the Invention] Like the detailed explanation to the above, two or more threads are those of ***** rare ***** in a variety of ***** , since increase and a process are complicated by forged cost to forge by simple technique, the forged prevention form of this invention is difficult to forge, and also the analysis of a true ticket also becomes difficult [cost] in activity, and it has marked forgery and the alteration prevention effectiveness as compared with the conventional forged prevention form. Moreover, since printing of a pattern or an alphabetic character is carried out, reproduction of a forged prevention form can be made much more difficult at the thread for forged prevention forms of this invention.

[Translation done.]

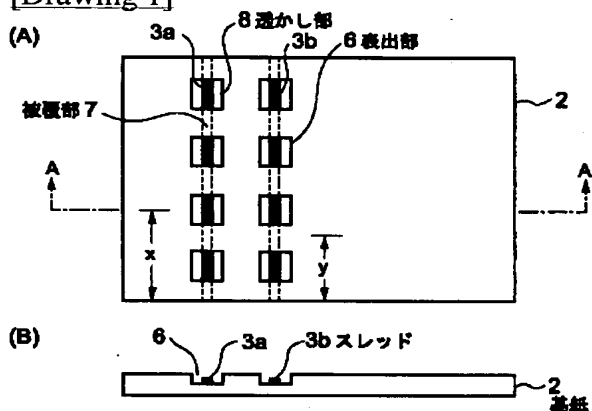
* NOTICES *

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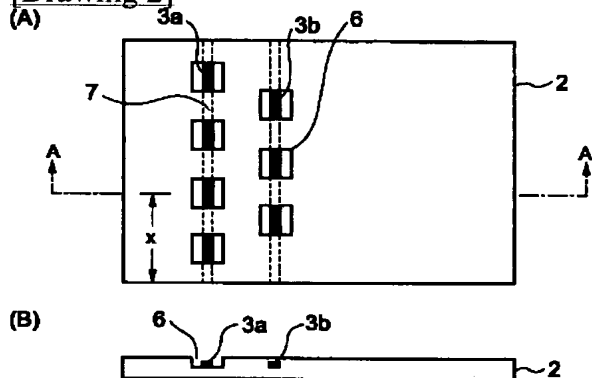
1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

DRAWINGS

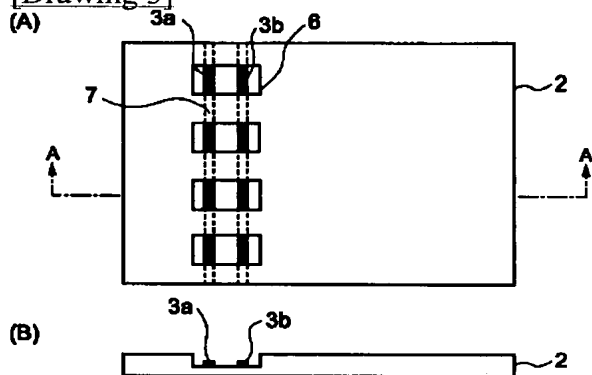
[Drawing 1]



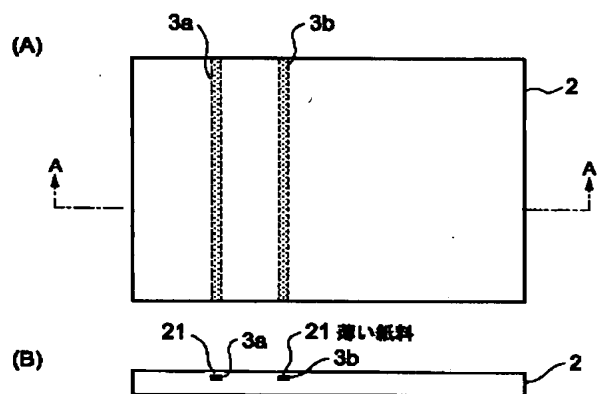
[Drawing 2]



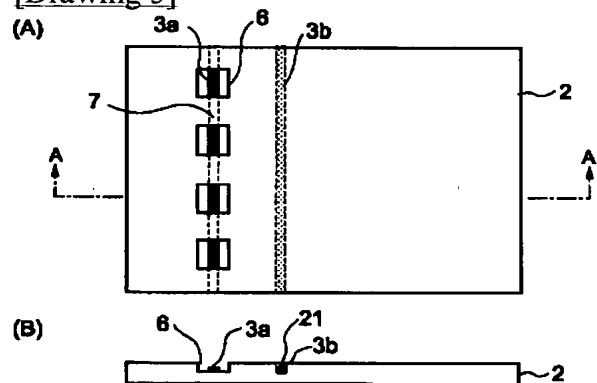
[Drawing 3]



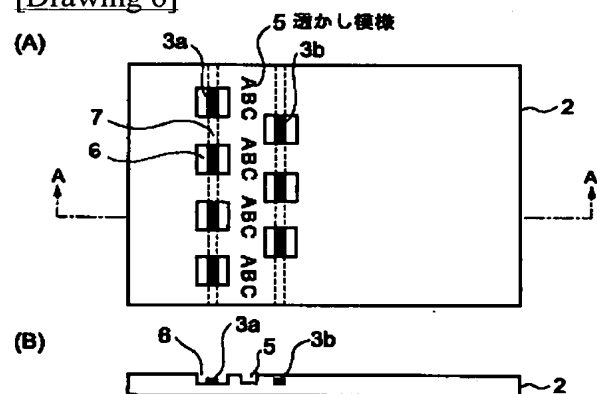
[Drawing 4]



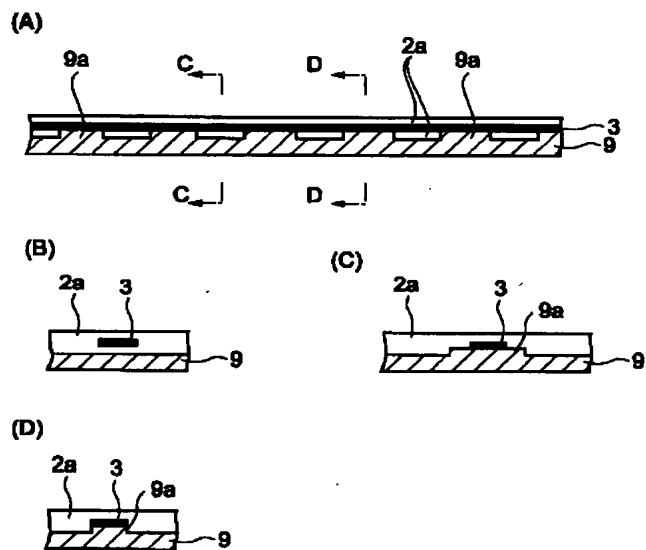
[Drawing 5]



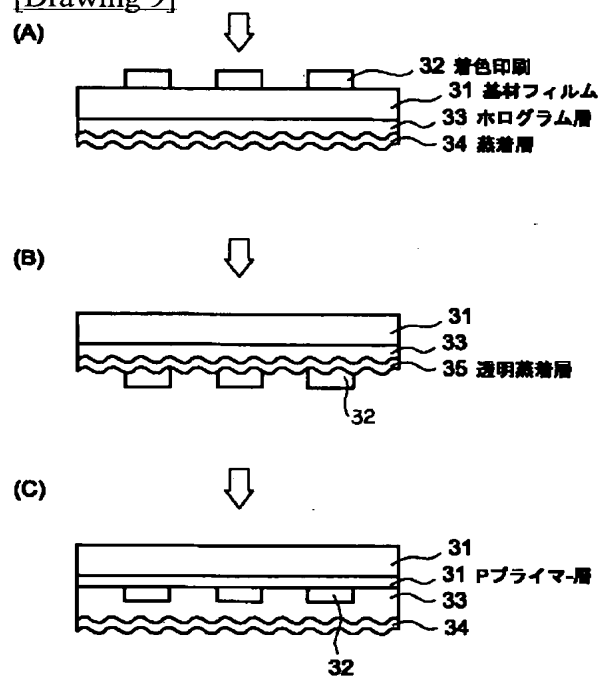
[Drawing 6]



[Drawing 7]



[Drawing 9]



[Drawing 8]



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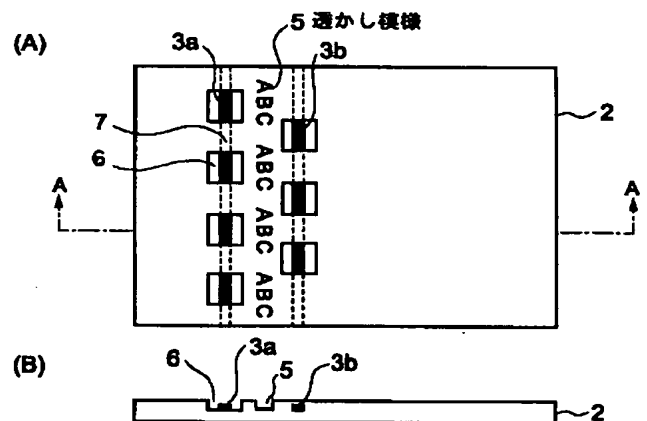
4L055 AJ02 AJ10 BD20 GA45

(54) 【発明の名称】 偽造防止用紙および偽造防止用紙用スレッド

(57) 【要約】

【課題】 基紙に複数本のスレッドを抄き込んだ偽造防止用紙と偽造防止用紙用スレッドを提供する。

【解決手段】 本発明の偽造防止用紙は、基紙2に複数本のスレッド3を平行に抄き込んで設けた偽造防止用紙であって、上記基紙は、該スレッドを間欠的に露出する表出部6と該表出部間であって該スレッドを間欠的に覆う被覆部7とを備え、少なくとも隣接する2本のスレッドの当該表出部と被覆部が、用紙の端部からの同一位置において同一状態または異なる状態に現れていることを特徴とする。表出部に2本以上のスレッドを含ませること、スレッドを模様または文字入りとすること、スレッド間やその周辺に透かし模様5を設けることもできる。本発明の偽造防止用紙用スレッドは、その表面に模様または文字が印刷されていることを特徴とする。



【特許請求の範囲】

【請求項 1】 基紙に複数本のスレッドを平行に抄き込んで設けた偽造防止用紙であって、上記基紙は、該スレッドを間欠的に露出する表出部と該表出部間であって該スレッドを間欠的に覆う被覆部とを備え、少なくとも隣接する 2 本のスレッドの当該表出部と被覆部が、用紙の端部からの同一位置において同一状態に現れていることを特徴とする偽造防止用紙。

【請求項 2】 基紙に複数本のスレッドを平行に抄き込んで設けた偽造防止用紙であって、上記基紙は、該スレッドを間欠的に露出する表出部と該表出部間であって該スレッドを間欠的に覆う被覆部とを備え、少なくとも隣接する 2 本のスレッドの当該表出部と被覆部が、用紙の端部からの同一位置において異なる状態に現れていることを特徴とする偽造防止用紙。

【請求項 3】 基紙に複数本のスレッドを平行に抄き込んで設けた偽造防止用紙であって、上記基紙は、該スレッドを間欠的に露出する表出部と該表出部間であって該スレッドを間欠的に覆う被覆部とを備え、当該表出部と被覆部に 2 本以上のスレッドが含まれていることを特徴とする偽造防止用紙。

【請求項 4】 基紙に複数本のスレッドを平行に抄き込んで設けた偽造防止用紙であって、少なくとも隣接する 2 本のスレッドはその模様または文字が紙層を透して視認できる程度の紙料によって基紙に埋め込まれていることを特徴とする偽造防止用紙。

【請求項 5】 基紙に複数本のスレッドを平行に抄き込んで設けた偽造防止用紙であって、少なくとも隣接する 2 本のスレッドのうちの 1 本のスレッドは、基紙を間欠的に露出する表出部と該表出部間であって該スレッドを間欠的に覆う被覆部とにより交互に基紙表面に現れ、他の 1 本のスレッドは、その模様または文字が紙層を透して視認できる程度の紙料によって基紙に埋め込まれていることを特徴とする偽造防止用紙。

【請求項 6】 基紙に複数本のスレッドを平行に抄き込んで設けた偽造防止用紙であって、複数のスレッド間あるいはその周辺に透かし模様が設けられていることを特徴とする偽造防止用紙。

【請求項 7】 上記複数本のスレッドが模様または文字入りスレッドからなることを特徴とする請求項 1 から請求項 6 記載の偽造防止用紙。

【請求項 8】 上記複数本のスレッドがホログラムスレッド、光輝性スレッド、印刷加工スレッド、印刷加工ホログラムスレッド、示温スレッド、蛍光スレッド、磁気スレッド、模様または文字入りスレッド、から選ばれた同種または 2 種以上のスレッドの組み合わせからなることを特徴とする請求項 1 から請求項 6 記載の偽造防止用紙。

【請求項 9】 上記スレッドが、紙料と接する部分に接着層を備えることを特徴とする請求項 1 から請求項 8 記

載の偽造防止用紙。

【請求項 10】 偽造防止用紙に抄き込んで使用するための樹脂フィルム基材からなるスレッドであって、スレッドに模様または文字が印刷されていることを特徴とする偽造防止用紙用スレッド。

【請求項 11】 樹脂フィルム基材の表面にホログラムパターンまたは光回折格子パターンを有することを特徴とする請求項 10 記載の偽造防止用紙用スレッド。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】この発明は、スレッドを備えた偽造防止用紙および偽造防止用紙用スレッドに関し、詳しくは基紙に光輝性スレッド等を複数本抄き込んで高度の偽造、改ざん防止効果を図った偽造防止用紙およびそれに使用する偽造防止用紙用スレッドに関する。このような偽造防止用紙は、商品券、ギフト券、証明書、チケット、投票券、切符、ラベル等の各種セキュリティ媒体に使用することができる。

【0002】

【従来技術】各種セキュリティ媒体の偽造防止策として、種々のスレッドを用紙に抄き込む手法がある。このようなスレッドによる偽造防止手段は用紙を製造する段階において設けられるので、カラーコピーやスキャナー取込み、製版印刷等による方法での偽造は困難である。しかし、各種セキュリティ媒体が実際に使用される現場においては十分な真偽判定が行えるとは限らないため、コピー等の偽造手法と合わせて、真正のスレッドに似せた偽造スレッドを単純に貼り付けただけの方法による粗悪な偽造品においても本物として流通してしまう可能性がある。従って、スレッド自体だけでなく、スレッドのセキュリティ媒体への抄き込み方法においても偽造防止効果を高める必要がある。

【0003】このような光輝性スレッド等入りの偽造防止用紙については、特開平 6-306799 号、実用新案登録 3028886 号（実願平 8-1625 号）、特開平 7-207599 号公報等がある。しかし、いずれの先行技術も 1 本のスレッドまたは光輝性細片を基紙に抄き込んだもので複数本のスレッドを抄き込んで高度の偽造防止を図った技術は見られない。また、本願出願人による特開平 10-71759 号公報には、以上の観点からスレッドを窓部から表出するように入れたウィンド付きスレッド用紙等のスレッド入り用紙の種々の態様を提案しているが、上記偽造手法に対しては万全の対策を施したものとは言えない。そこで、本発明はスレッドを複数本使用してその抄き込み形態を種々設けることにより偽造、改ざん防止の一層の困難化を図った。さらに、スレッド自体に模様または文字の印刷を施して偽造防止効果を高めたものも提案し、これら各種のスレッドの同種または異種を組み合わせる使用することにより、一層の偽造防止効果を図ろうとするものである。

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【0004】

【課題を解決するための手段】上記課題を解決するための本発明の要旨の第1は、基紙に複数本のスレッドを平行に抄き込んで設けた偽造防止用紙であって、上記基紙は、該スレッドを間欠的に露出する表出部と該表出部間であって該スレッドを間欠的に覆う被覆部とを備え、少なくとも隣接する2本のスレッドの当該表出部と被覆部が、用紙の端部からの同一位置において同一状態に現れていることを特徴とする偽造防止用紙、にある。かかる偽造防止用紙であるため、偽造、改ざんが困難である。

【0005】上記課題を解決するための本発明の要旨の第2は、基紙に複数本のスレッドを平行に抄き込んで設けた偽造防止用紙であって、上記基紙は、該スレッドを間欠的に露出する表出部と該表出部間であって該スレッドを間欠的に覆う被覆部とを備え、少なくとも隣接する2本のスレッドの当該表出部と被覆部が、用紙の端部からの同一位置において異なる状態に現れていることを特徴とする偽造防止用紙、にある。かかる偽造防止用紙であるため、偽造、改ざんが困難である。

【0006】上記課題を解決するための本発明の要旨の第3は、基紙に複数本のスレッドを平行に抄き込んで設けた偽造防止用紙であって、上記基紙は、該スレッドを間欠的に露出する表出部と該表出部間であって該スレッドを間欠的に覆う被覆部とを備え、当該表出部と被覆部に2本以上のスレッドが含まれていることを特徴とする偽造防止用紙、にある。かかる偽造防止用紙であるため、偽造、改ざんが困難である。

【0007】上記課題を解決するための本発明の要旨の第4は、基紙に複数本のスレッドを平行に抄き込んで設けた偽造防止用紙であって、少なくとも隣接する2本のスレッドはその模様または文字が紙層を透して視認できる程度の紙料によって基紙に埋め込まれていることを特徴とする偽造防止用紙、にある。かかる偽造防止用紙であるため、偽造、改ざんが困難である。

【0008】上記課題を解決するための本発明の要旨の第5は、基紙に複数本のスレッドを平行に抄き込んで設けた偽造防止用紙であって、少なくとも隣接する2本のスレッドのうちの1本のスレッドは、基紙を間欠的に露出する表出部と該表出部間であって該スレッドを間欠的に覆う被覆部とにより交互に基紙表面に現れ、他の1本のスレッドは、その模様または文字が紙層を透して視認できる程度の紙料によって基紙に埋め込まれていることを特徴とする偽造防止用紙、にある。かかる偽造防止用紙であるため、偽造、改ざんが困難である。

【0009】上記課題を解決するための本発明の要旨の第6は、基紙に複数本のスレッドを平行に抄き込んで設けた偽造防止用紙であって、複数のスレッド間あるいはその周辺に透かし模様が設けられていることを特徴とする偽造防止用紙、にある。かかる偽造防止用紙であるため、偽造、改ざんが困難である。

【0010】上記課題を解決するための本発明の要旨の第7は、偽造防止用紙に抄き込んで使用するための樹脂フィルム基材からなるスレッドであって、スレッドに模様または文字が印刷されていることを特徴とする偽造防止用紙用スレッド、にある。かかる偽造防止用紙用スレッドであるため、偽造、改ざんが困難な偽造防止用紙に好適に使用することができる。

【0011】

【発明の実施の形態】スレッドを窓部に表出するように入れた偽造防止用紙は、例えば基紙に光輝性スレッド等を抄き込んだタイプの用紙であって、基紙が光輝性スレッドを間欠的に露出する表出部（ウィンド）と、該表出部間で光輝性スレッドを間欠的に覆う被覆部とを備えたものが知られている。この構成の偽造防止用紙は、多筒式抄紙機の一つの抄き網部上に、スレッドと同じ幅がそれより広幅の小さな凸部を設け、この凸部の上にスレッドを載せた状態で紙料液を供給することによって製造できる。つまり、このようにすれば、凸部のない位置ではスレッドが紙料液で挟まれるので被覆部が形成され、凸部の位置ではスレッドが紙料液の下面側から露出するので表出部が形成される。

【0012】上記の構成のようなウィンド付きスレッド用紙においては、光輝性スレッド等が表出部において間欠的に露出しているため、コピーした場合でも金属色が再現されないことから偽造防止できる。また、偽造品かどうかを見るために用紙の端面を確認する必要がなく、しかも、光輝性スレッド等が基紙からはがれてしまうのを防止できる。

【0013】以下、本発明の実施形態を図面を参照して説明することにする。図1は、本発明の偽造防止用紙の第1の実施形態を示す図である。図1(A)はその平面図、図1(B)は、図1(A)のA-A線における断面を示している。図1のように、本発明の偽造防止用紙の第1の実施形態では、基紙2にスレッド3を複数本抄き込んだ構成であって、基紙2には、スレッド3を間欠的に露出する複数の表出部6と、各表出部間でスレッド3を間欠的に覆う被覆部7とを備えている。表出部6はスレッドと同幅でもよいが、それより広幅としてスレッド3の両サイドを透かし部8となるようにすることで、抄造時に発生するスレッドの公差（ブレ）を透かし部により吸収することができる。

【0014】この第1の実施形態では、表出部6と被覆部7とが複数本のスレッドに対してスレッド端における用紙の端部からの同一位置において同一状態に現れている特徴がある。すなわち、紙端からxの位置においてはスレッド3aに対してもスレッド3bに対しても共に表出部であり、紙端からyの位置においてはスレッド3aに対してもスレッド3bに対しても共に被覆部となっている。ただし、基紙2は、スレッド3の両端部分がいずれのスレッドに対しても被覆部7として構成されている

ことが好ましい。スレッドの端部が露出しているとスレッドの剥離が生じるからである。使用するスレッドの幅は用紙の使用目的にもより特に制限されないが、0.2 mm～5 mm程度のもが通常使用される。複数のスレッドの幅は同幅である必要はなく、また色調、光学特性、発色特性、磁気特性等をそれぞれ変えることも任意である。このように、セキュリティ媒体に2本以上の複数のスレッドを導入することにより、偽造スレッドを単純に貼り付けるような方法は偽造コストが増大し、工程が複雑となるため、偽造抑制効果が増大する。

【0015】図2は、本発明の偽造防止用紙の第2の実施形態を示す図である。図2(A)はその平面図、図2(B)は、図2(A)のA-A線における断面を示している。図2のように、本発明の偽造防止用紙の第2の実施形態では、基紙2にスレッド3を複数本抄き込んだ構成であって、基紙2は、スレッド3を間欠的に露出する複数の表出部6と、各表出部間でスレッド3を間欠的に覆う被覆部7とを備えていることは第1の実施形態と同一である。この第2の実施形態では、表出部6と被覆部7とが複数本のスレッドのうちの少なくとも隣接する2本のスレッド間において、スレッド端における用紙の端部からの同一位置において異なる状態に現れている特徴がある。すなわち、紙端からxの位置においてはスレッド3aに対しては表出部、スレッド3bに対しては被覆部となっている。ただし、基紙2は、スレッド3の両端部分が被覆部7として構成されていることが好ましいのは第1の実施形態と同一であり、以下の実施形態においても同様である。このように、表出部をいわゆる千鳥状に設ける場合は、用紙を積み重ねた場合のスレッド部の盛り上がりや低減することができ、印刷加工を容易にし、巻き取り用紙の取扱い時における巻崩れを防止することができる。

【0016】図3は、本発明の偽造防止用紙の第3の実施形態を示す図である。図3(A)はその平面図、図3(B)は、図3(A)のA-A線における断面を示している。図3のように、本発明の偽造防止用紙の第3の実施形態では、基紙2にスレッド3を複数本抄き込んだ構成であって、基紙2は、スレッド3を間欠的に露出する複数の表出部6と、各表出部間でスレッド3を間欠的に覆う被覆部7とを備えることは第1の実施形態と同一であるが、この第3の実施形態では、1つの表出部6と被覆部7には2本以上のスレッド3a、3bが含まれている特徴がある。このように、1つの表出部に複数のスレッドを設ける場合、表出部の折り曲げ強度低下を補うことができる。

【0017】図4は、本発明の偽造防止用紙の第4の実施形態を示す図である。図4(A)はその平面図、図4(B)は、図4(A)のA-A線における断面を示している。図4のように、本発明の偽造防止用紙の第4の実施形態では、基紙2にスレッド3を複数本抄き込んだ構

成であるが、基紙2は、スレッド3を間欠的に露出する表出部を持たず、スレッドはその模様または文字が紙層を透して視認できる程度の紙料21によって基紙に埋めこまれている特徴がある。このような埋め込みスレッドに印刷模様または文字を設けておけばスレッド上の紙料の調整により、スレッドの模様等を視認することができる。スレッドに対する印刷模様の印刷面は、偽造防止用紙券面の表面からでも裏面からでもさらには両面からでも視認できるように適宜選択すればよい。このように複数のスレッドを全て用紙内に埋め込むとスレッドを構成する材料を外観から識別することが困難となるため、1本のスレッドを機械認識型とした場合、もしくは種類の異なる機械認識型スレッドを併用した場合、どのスレッドがどのような機械認識されるかを解析することが困難となる効果がある。

【0018】偽造防止用紙は、通常白色等の明るい基紙が使用されるので、本来光の透過性がある。したがって紙の表面から入射した光がスレッドまで到達すれば、スレッドからの反射光が生じ、スレッドの表面に着色剤による模様または文字があれば着色剤による吸収が生じ、吸収のあった反射光は他の部分と分光特性が異なるので人の目でも判別することができる。通常、偽造防止用紙には、 104 g/m^2 程度の紙が使用され、薄い紙料21側が 35 g/m^2 程度であれば、スレッド上の模様を十分に観察したり判別することができる。また、厚い紙料側が 70 g/m^2 程度であってもスレッド上の模様または文字は、明瞭さは劣るが観察したり判別することはできる。

【0019】図5は、本発明の偽造防止用紙の第5の実施形態を示す図である。図5(A)はその平面図、図5(B)は、図5(A)のA-A線における断面を示している。図5のように、本発明の偽造防止用紙の第5の実施形態では、基紙2にスレッド3を複数本抄き込んだ構成であるが、少なくとも隣接する2本のスレッド3a、3bのうちの1本のスレッドは、基紙を間欠的に露出する表出部6と該表出部間であって該スレッドを間欠的に覆う被覆部7とにより交互に基紙表面に現れ、他の1本のスレッドはその表面模様が紙層を透して表面または裏面から視認できる程度の薄い紙料21によって全体が基紙に埋めこまれている特徴がある。この場合は、偽造スレッドを単純に貼り付けるような手法で偽造する場合に、外観上異なる状態のスレッドをそれぞれ再現する必要があり、偽造コストの増大、工程複雑化により偽造防止効果が増大する。

【0020】図6は、本発明の偽造防止用紙の第6の実施形態を示す図である。図6(A)はその平面図、図6(B)は、図6(A)のA-A線における断面を示している。図6のように、本発明の偽造防止用紙の第6の実施形態では、基紙2にスレッド3を複数本抄き込んだ構成であるが、複数のスレッド間あるいはその周辺に透か

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【0026】図8は、印刷加工スレッドの実施形態を示す図である。印刷加工スレッドは、基材フィルム、着色印刷、オーバープリントの積層順を適宜選択することができるので各種の実施形態があるが、主な実施形態を挙げれば図8のようになる。図8（A）は、透明基材フィルム31tの一方の面にプライマー層31pを介して着色印刷32を裏刷りし、さらに着色オーバープリント32pを施した実施形態、図8（B）は、透明基材フィルム31tの一方の面に着色印刷32を直接裏刷りし、さ

らに透明オーバープリント32pを施した実施形態、図8(C)は、着色基材フィルム31cの一方の面に着色印刷32を直接表刷りし、さらに透明オーバープリント32pを施した実施形態であり、それぞれ断面図を示している。いずれも矢印側が偽造防止用紙の表面側となり、例えば小文字で「ABC」と印刷した場合は、表面から観察した場合はいずれの場合も図8(D)のように見えることになる。なお、オーバープリント32pは設けなくても良いが、着色印刷層が最外層となる場合は、耐久性がやや弱くなることになる。着色印刷32とオーバープリント32pまたは基材フィルム31の色の組み合わせにより独自の色彩効果を発揮することができる。このような細かい模様や文字の印刷パターンが形成されたスレッドを「模様または文字入りスレッド」と呼ぶことにする。

【0027】基材フィルムとしては、例えば、ポリエチレンテレフタレートフィルムを始めとするポリエステルフィルム、ポリスチレンフィルム、ポリプロピレンフィルム、ポリサルホンフィルム、ポリフェニレンサルファイドフィルム、ポリカーボネートフィルム、セルロース系樹脂フィルム、これら各種の樹脂フィルムに金属蒸着を施したフィルムなどのほか、コンデンサー用紙やアルミ箔フィルムあるいはアルミ箔との積層フィルムを使用することができる。基材フィルムの厚さとしては、1～200 μ m、抄き込み部に凹凸を生じないためには薄い基材が良く、好ましくは、10～50 μ mの厚さが推奨できる。

【0028】これらの基材に印刷を施すためには、グラビア、オフセット、シルクスクリーン印刷等が行われる。連続した巻き取り状のフィルムに連続的な工程で印刷を施す場合には輪転グラビア、オフセット輪転、輪転シルクスクリーン印刷が好ましく行われる。使用する印刷インキとしては抄紙工程における耐水性と偽造防止用紙を各種の目的に使用した場合におけるある程度の耐熱性等を備えるものであればよく、着色剤としても耐水性等の要件を満たせば顔料系、染料系のいずれであってもよい。基材フィルムへの直接の印刷では十分な接着力が得られない場合は、前記のようにプライマー層を介して印刷することが行われる。さらに印刷層の保護のために印刷パターン上にオーバープリントを設けることも通常行われる。なお、模様または文字は直接印刷以外の類似の手段で施すこともでき、例えば転写印刷方法や感熱転写印刷、エンボス方法等があり、これらが本発明の実施形態から除外されるものではない。

【0029】＜印刷加工ホロスレッド＞ホログラムを有するフィルムに印刷を施したスレッドで、ホログラムと印刷とによる複合した偽造、改ざん防止効果が生じる特徴がある。図9は、印刷加工ホロスレッドの実施形態を示す図である。印刷加工ホロスレッドにも各種の実施形態があり、図9(A)は、基材フィルム31の一方の面

に着色印刷32を表刷りした後、他方の面にホログラム層33の加工を施し、さらにホログラム層上にアルミ等の蒸着層34を設けた形態である。ホログラム層は印刷加工前に設けてもよい。この実施形態の場合は、全面アルミ蒸着層34を設けるので、スレッドの光輝性は高くなるが、スレッドの下面は隠蔽されることになる。

【0030】図9(B)は、基材フィルム31にホログラム層33の加工を施した後、当該ホログラム層上に透明蒸着層35の形成を行い、さらに当該透明蒸着層35上に着色印刷32を裏刷りで設けた形態である。この実施形態の場合は、透明蒸着層35を設けるので、ホログラム層により光の回折光が生じる他、透明蒸着層を透して、その下側の印刷層や紙基材を観察できる効果がある。図9(C)は、基材フィルム31にプライマー層31pを介して着色印刷32を裏刷りで施した後、当該印刷面にホログラム層33の加工を施し、さらにホログラム層上にアルミ蒸着層34を設けた形態である。この実施形態の場合も、全面アルミ蒸着層34を設けるので、スレッドの光輝性は高くなるがスレッド下面は隠蔽されることになる。また、スレッドが抄き込まれた状態で印刷面が基材フィルムの下面にあるので、印刷部の保護の効果が高くなる。いずれも矢印側が偽造防止用紙の表面側となる。使用する印刷インキとしては前記の条件を満たすほか、ホログラムの輝きを阻害しないためには、透明性のあるインキが好ましい。

【0031】蒸着層34は、表面からの光を全反射させる目的の場合は不透明な反射層として形成し、その場合の金属蒸着には、アルミニウム、クロム、ニッケルあるいは銀、金等の光輝性の単一成分の金属か青銅、真鍮、白銅等の合金等を使用する。アルミ蒸着等の場合は、100 \AA ～2000 \AA 程度の厚みに形成するが、好ましくは200 \AA ～1000 \AA 程度の厚みである。合金は着色もしくは薄膜の反射率を調整する場合に用いられるが、金属化合物を使用する場合は、その選択により透明または半透明の蒸着層にできる効果がある。これには金属あるいは合金の酸化物、硫化物等の金属化合物を使用することができ、硫化亜鉛(ZnS)、酸化チタン(TiO₂)、フッ化マグネシウム(MgF₂)、チタン酸バリウム(BaTiO₂)等が好ましく使用される。

【0032】＜示温スレッド＞基材フィルム上に、温度変化により可逆的に変色する示温材料を塗布または印刷して形成したスレッドであって、加熱や気温の変化あるいは手に持った際の体温で変色し温度が下がればまた元の色に戻る所以で真正品か偽造品かを容易に識別することができる。このような示温性を示す材料は、電子供与性有機化合物とフェノール性水酸基を有する化合物と、この二化合物の呈色反応を減感する不揮発性の化合物をの三成分を必須成分とし、このような化合物をビヒクル中に直に溶解または分散するか、微小カプセルに内包した

ものをビヒクル中に分散したものを印刷インキとして使用することができる。このような示温材料は無色から有色へ、あるいは有色から無色へと顕著な色変化を示すことで従来の熱変色性素材と異なり、透明性があるため下地を視認できる特徴もある。また、このような着色料に一般の染料、顔料等を添加することにより有色から有色へと変化させることもできる。

【0033】例えば、電子供与性呈色性有機化合物としては、3-ジエチルアミノ、6-メチル、7-クロロフルオラン、フェノール性水酸基を有する化合物として、ビスフェノールA、滅感化合物としてステアリルアルコール、ビヒクルとしてマイクロクリスタリンワックスを適宜量加え、100°Cに加熱溶解して均質化した材料による印刷物は、20°Cで赤色を呈し、50°Cに加熱することにより無色に変化し、20°Cに戻すと再び赤色になる可逆性を示す。また、電子供与性呈色性有機化合物としては、クリスタルバイオレットラクトン、フェノール性水酸基を有する化合物として、没食子酸ラウリルエステル、滅感化合物としてミリスチルアルコール、ビヒクルとしてマイクロクリスタリンワックスを適

宜量加え、100°Cに加熱溶解して均質化した材料による印刷物は、20°Cで無色を呈し、50°Cに加熱することにより青色に変化し、20°Cに戻すと再び無色になる可逆性を示す。この他、材料の選択範囲や組み合わせが各種あり、色調や温度範囲を制御することが可能である。

【0034】＜蛍光スレッド＞基材フィルム上に、光の刺激を受けて蛍光を発光する材料を塗布または印刷して形成したスレッドであって、受光時に発光する狭義の蛍光と光を蓄えて刺激停止後に発光する燐光とがある。有機蛍光材料は狭義の蛍光、無機蛍光材料は蓄光に属するものが多い。ルモゲンイエロー、ルモゲンブリリアントイエロー、ルモゲンブリリアントグリーンは、ブラックライトの紫外線を受けて、黄色ないし緑色の蛍光を発光する有機蛍光材料として知られている。また無機蛍光材料としては、ZnS:Cu(緑)、(Zn, Cd)S:Cu(黄)、CaS:Bi(青)、(Zn, Cd)S:Cu(橙)、(Zn, Cd)S:Cu(赤)等を使用することができる。

【0035】＜磁気スレッド＞基材フィルム上に、磁性を示す材料を塗材として塗布または印刷して形成したスレッドであって、磁石や鉄粉等に対して反応するため、真正品か偽造品かを容易に識別することができる。磁性材料の高保持力材料としては、BaFe₁₂O₁₃、γ-Fe₂O₃、Co-γ-Fe₂O₃、Fe₃O₄等があり、低保磁力材料としては、センダスト合金、Ni-Znフェライト、Mn-Znフェライト、Mo-パーマロイ粉等がある。これらの磁性体の粒径が、数十nm～数μmのものを、ポリエステル樹脂、エポキシ樹脂等の高分子樹脂バインダー中に溶解分散して使用することが

できる。

【0036】なお、上記の各スレッドを抄き込む際は、熱溶解温度60～80°Cの水可溶性バインダー等からなる接着層を裏面に備えたものを用いることができる。このように構成すれば、偽造防止用紙が完成した状態でスレッド3が基紙2に接着するので、基紙2と光輝性スレッド3の密着性が向上する。

【0037】

【実施例】（実施例）以下、本発明の実施例を図面を参照して説明する。

＜印刷加工スレッドの作製＞偽造防止用紙用スレッドの基材フィルム31として、透明な厚み16μmのポリエチレンテレフタレートフィルム（東レ株式会社製「ルミラーS-28」）に、グラビア印刷で以下の仕様による印刷を施した。

・プライマーコート

プライマー剤（ザ・インクテック株式会社製「THFプライマー」（ポリエステル、塩酢ビ樹脂混合系））を版深の浅いグラビア版を使用して0.6g/m²にコートした。

・着色パターン印刷

「ABC」の小文字の組み合わせからなるパターンを赤色のインク（ザ・インクテック株式会社製「着色OPニスレッド」（塩酢ビ樹脂系））を使用して裏刷りで印刷した。印刷版にはグラビアダイレクト版を使用した。

・着色パターン印刷後、薄青色の着色オーバープリント用ニス（ザ・インクテック株式会社製「着色OPニスブルー」（塩酢ビ樹脂系））を使用してオーバープリントコート32pを行った（図8（A））。

以上のようにして印刷されたスレッドをスリッター機を使用して、2mm幅に細断して、偽造防止用紙用スレッドとした。

【0038】＜印刷加工ホロスレッドの作製＞偽造防止用紙用スレッドの基材フィルム31として、透明な厚み16μmのポリエチレンテレフタレートフィルム（東レ株式会社製「ルミラーS-28」）にホログラム層33を形成したものをを使用した。ホログラムパターン形成には、紫外線硬化性アクリル樹脂（三菱化学株式会社製「ユビマーLZ065S」）を使用して、基材フィルム上にグラビアリバースコート法で、1.5g/m²に塗工した後、ホログラムパターン型版を熱エンボスしてパターンを写し取り、紫外線照射してホログラムの凹凸パターンを完全に保持できるようにした。その後、酸化チタン（TiO₂）を使用して、ホログラム層33上に、透明蒸着層35を厚み450Åに形成し、さらにその上に「ABC」の小文字のパターンを赤色のインク（ザ・インクテック株式会社製「着色OPニスレッド」（塩酢ビ樹脂系））を使用して裏刷りで印刷を行った（図9（B））。その後、印刷加工スレッドと同様に、スリッター機を使用して、2mm幅に細断して、偽造防止用紙

用スレッドとした。

【0039】<偽造防止用紙の抄造>上記で製造した印刷加工スレッドと印刷加工ホロスレッドの1本ずつの2本が図3のように偽造防止用紙に現れるように、表出部6がピッチ10mm×幅30mm、被覆部7がピッチ10mmで繰り返される抄き網パターンの抄紙機で、90kg/四六版の上質紙に抄造した。なお、被覆部7の上部の紙料が35g/m²、被覆部の下部の紙料が69g/m²となるように抄き網部の凸部の高さを調整した。このようにして完成した偽造防止用紙は、被覆部において印刷加工スレッド、印刷加工ホロスレッドのいずれの場合も小文字を識別することができ、表出部においては印刷加工ホロスレッドの輝きが見られ、また、ホログラムスレッドの表出部では、ホログラムパターンを通して小文字印刷が見えるため、後刷りで印刷を加えたものと確実に判別が可能であり、偽造防止用紙として有用に使用することができた。

【0040】

【発明の効果】以上に詳述のように本発明の偽造防止用紙は、複数本のスレッドが諸種の抄きこみの態様で抄き込まれているので、単純な手法により偽造するには偽造コストが増大、工程が複雑化するため偽造が困難であるほか、真券の解析もコスト的、作業的に困難となり、従来の偽造防止用紙に比較して格段の偽造、改ざん防止効果を有する。また、本発明の偽造防止用紙用スレッドには、模様や文字の印刷がされているので偽造防止用紙の複製を一層困難なものとすることができる。

【図面の簡単な説明】

【図1】 本発明の偽造防止用紙の第1の実施形態を示す図である。

【図2】 本発明の偽造防止用紙の第2の実施形態を示す図である。

【図3】 本発明の偽造防止用紙の第3の実施形態を示*

*す図である。

【図4】 本発明の偽造防止用紙の第4の実施形態を示す図である。

【図5】 本発明の偽造防止用紙の第5の実施形態を示す図である。

【図6】 本発明の偽造防止用紙の第6の実施形態を示す図である。

【図7】 スレッド入り偽造防止用紙を抄き込む状態を示す図である。

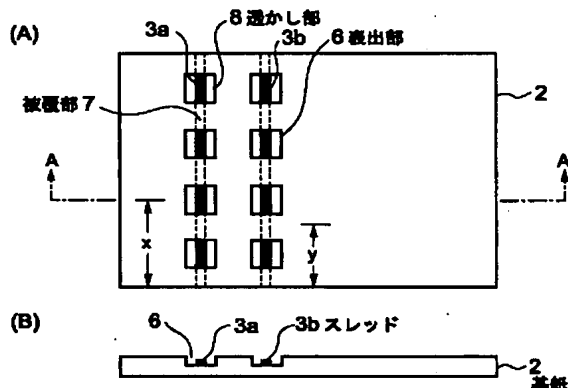
【図8】 印刷加工スレッドの実施形態を示す図である。

【図9】 印刷加工ホロスレッドの実施形態を示す図である。

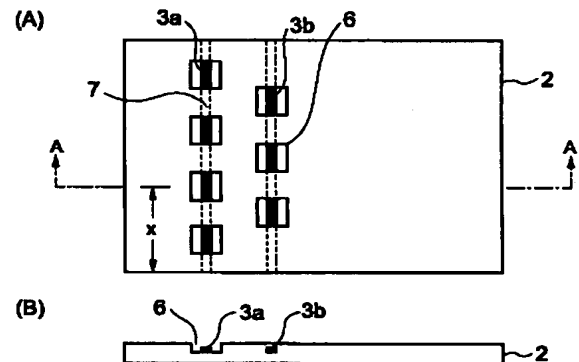
【符号の説明】

- 2 基紙
- 2 a 紙料液
- 3 スレッド
- 5 透かし模様
- 6 表出部
- 7 被覆部
- 8 透かし部
- 9 すき網部
- 9 a すき網部の凸部
- 21 薄い紙料
- 31 基材フィルム
- 31 c 着色基材フィルム
- 31 t 透明基材フィルム
- 31 p プライマー層
- 32 着色印刷
- 32 p オーバープリント
- 33 ホログラム層
- 34 蒸着層
- 35 透明蒸着層

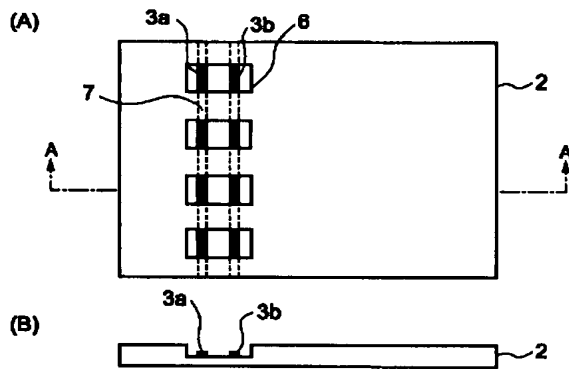
【図1】



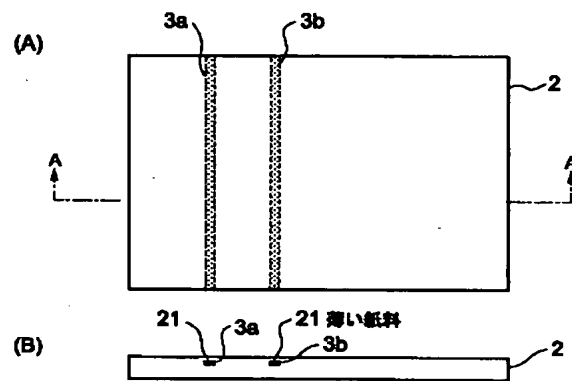
【図2】



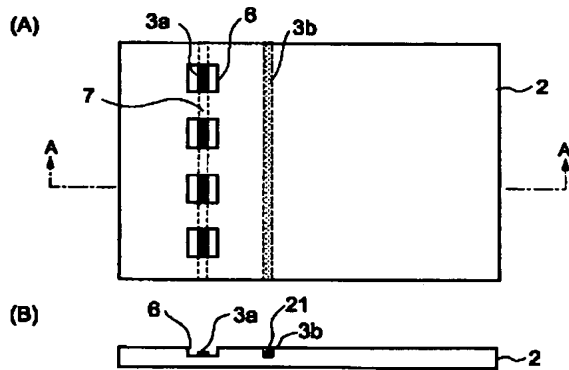
【図3】



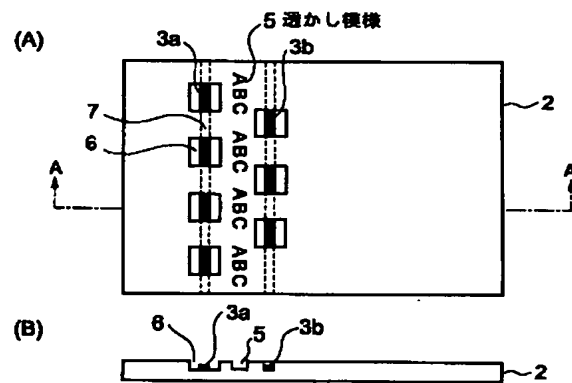
【図4】



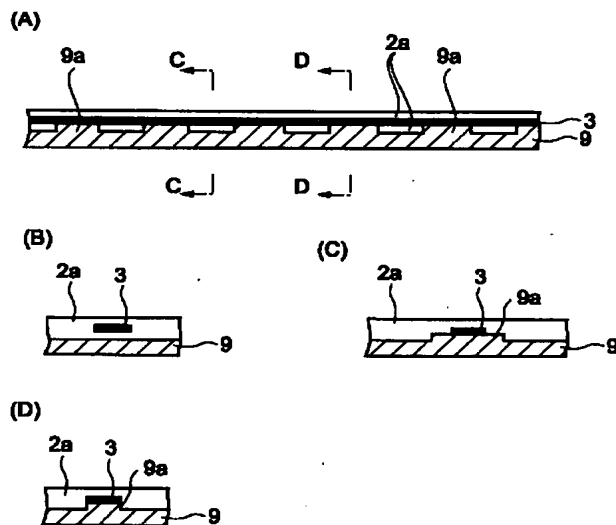
【図5】



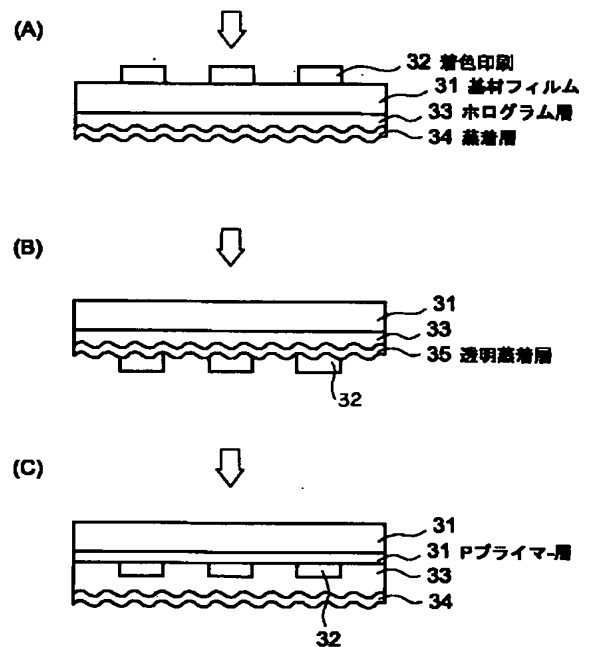
【図6】



【図7】



【図9】



【図8】

